

Sponges,' p. 757 (by a misprint it came out p. 717), as follows:— "In the tubular *Euplectella aspergillum* and in allied forms the central cavity . . . appears as a preoscular tube." In other words, the central cavity is of exhalant nature. Well and good! But on the very next page of the same work we read, "The cribriform membrane which is stretched over the wide terminal pseudoscula of *Dendrilla cavernosa*, covering the entrances to the vestibular cavities, is very remarkable. I do not hesitate to compare it directly to the terminal sieve of *Euplectella aspergillum*. I think it may not be impossible that in some of the cup-shaped or tubular Hexactinellida the central cavity is, like that of *Dendrilla cavernosa*, an inhalant vestibule, and not a præoscular tube." That is to say, the sieve-membrane covering the central cavity in *Euplectella* is compared directly with a similar sieve covering an inhalant space in another sponge. The only rational conclusion from such a homology appeared to me to be that the central space in *Euplectella* was to be regarded as inhalant also. In commenting on these statements I concluded by saying it was not necessary to point out the contradictions in which the author had landed himself. I only hope I have made it clear how I gathered from Dr. von Lendenfeld's statements the meaning I imputed to them. I do not quite follow Dr. von Lendenfeld's meaning when he speaks of a "hostile motive" having prompted me in my interpretation of his statements, and cannot but deprecate the introduction of personalities into a scientific argument.

Zoological Station, Naples,
April 8, 1892.

On some Specimens of Dendroclava Dohrnii, Weismann. By
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On the 23rd October, 1891, the Director of the Zoological Station at Naples, with his usual courtesy, gave me some hydroids (*Sertularella*, *Eudendrium*, *Campanularia*) which the fishermen had brought from the coasts of Nisida. Amongst these were a few small colonies of hydrosomæ which at first sight appeared to me to be very similar to *Corydendrium*, although perhaps the zooids were somewhat smaller than those of *Corydendrium parasiticum*. One of these colonies grew from the stalk of a *Campanularia* in the same manner in which the trunks of *Corydendrium parasiticum* spring from those of *Eudendrium*, so that the resemblance between the two was the more striking.

On bringing these hydroid colonies under the microscope, I observed some medusoid buds under the neck of the zooids; and in this, as well as in other respects, the hydroids corresponded exactly with the *Dendroclava Dohrnii* described by Weismann, whose observations, as far as I know, have never yet been called in question.

These colonies were about 2 centimetres in height, somewhat

copiously ramified, and bearing branches on the right and the left of the trunk, although less frequently on the latter side than in the case of those described by Weismann. The coenosarc not only at the base of the colony, but also close to the summit, is formed, or rather issues, from two tubes described by Weismann, the outer one being smooth and straight, while the inner one has undulating lines. The zooids are club-shaped, with about twelve scattered tentacula, of which some were rather longer than the rest.

The medusoid buds proceed from a distinct pedicle, attached to the stalk of the supporting hydrosoma. From their structure, as Weismann observes, it is obvious that they become liberated and able to float away. I kept my colonies for two or three days, living in vessels in which the sea-water was constantly changed and kept in motion, and I was thus able to obtain a certain number of medusa-like zooids, which swam freely about like the medusæ of a *Bougainvillia* or a *Podocoryne*, and on comparing them with the medusoid buds of *Dendroclava* it was evident that they were the ultimate evolutionary forms of the latter.

The detached medusæ of *Dendroclava Dohrnii* are somewhat larger than those of *Podocoryne carnea*. They have a well-developed umbrella with prolongations: the manubrium, or pedicle, is on the other hand small, not reaching farther than the middle of the umbrella, and is somewhat bottle-shaped with small ramifications at its mouth. About halfway down appear four yellow-green radiated spots, "the gonophores," which have a smooth surface. There are four radiated canals, which are flattened as in the family *Tiaridae*. At the base of these there is a delicate longitudinal fibrillation. Of the eight marginal tentacles four are radial in continuation with the radial canals and four are intermediate, the base of all being excessively dense, while the lower side, as well as the distal extremity, bears an orange-coloured spot (ocello).

Weismann considers that this medusa should be placed in the family *Tiaridae* (Hæckel), and in the subfamily of the *Pandæidae*, while it may possibly be referred to the genus *Pandæa* (Lesson) or to *Conis* (Brandt). A close examination of the adult zooids shows that they have the characters of the *Tiaridae** and of the subfamily *Pandæidae*, but cannot be referred to the genus *Conis*, as they have no double crown of tentacles bearing ocelli on the shorter and upper of those bodies. This form may possibly not admit of being included in the genus *Pandæa*; at any rate I am unable to detect those urticating threads (Nesselstreifen) of the umbrella which distinguish the latter genus.

The polypoid form has been referred by Weismann to the family *Clavidae*. If, however, we follow Allman † the fact of its having gonophore medusoids would lead us rather to place it in the family

* E. Hæckel, 'Das System der Medusen.' Jena, 1879, 1 Theil, 1 Hæft, p. 40.

† A. F. Allman, 'A Monograph of Gymnoblætic, or Tubularian Hydroids,' 1872, London.

of the *Turrida*, from which we must at the same time remove the genus *Corydendrium*, which Allman had included in it on account of the uncertainty which still exists to its reproductive organs.

In regard to the habitat of this form, I may observe that my specimens were found in a very different condition from those of the first specimen described. Weismann had a colony which had been taken from a depth of 70 to 80 metres. On this account he refers to *Deudroclava Dolrni* as a form living at great depths. My specimens on the contrary had been taken off the coasts of Nisida, and it is only necessary to glance at a bathymetric map of the Gulf of Pozzuoli to see that the island of Nisida is surrounded by waters of very inconsiderable depth.—*Bolletino Scientifico*, N. 3 e 4, Anno 1891.

On the Development of Bythinia tentaculata. By Dr. R. v. ERLANGER, of the Heidelberg Zoological Institute.

Having been occupied for a long time with the embryology of Gastropods, I thought it desirable to test upon another Prosobranch the observations which I had made upon *Paludina vivipara*. For this purpose *Bythinia tentaculata* appeared to me to be most advantageous, since all the stages of development are to be had in any quantity, and the youngest are very suitable for sections on account of their relative size. Another circumstance strengthened me in my intention. *Bythinia* has already been the subject of a lengthy paper by P. Sarasin *, whose results were by no means to be reconciled with those which I had attained in the case of *Paludina*. The sequel will show that in almost all important points I have arrived at precisely opposite views to Sarasin, and that the development of *Bythinia* possesses a great similarity to that of *Paludina*.

After the expulsion of the directive vesicles the segmentation proceeds in the manner which is typical for the majority of Gastropods, and conforms closely to that of *Planorbis* and *Neritina*. Immediately after the division into two it becomes evident that the cells of the germ do not all divide simultaneously, but that the macromeres which are first formed gradually give rise to a large number of micromeres. I traced the segmentation as far as the stage with forty-eight cells: I did not succeed in following it further, on account of the excessive number of segments. By the time this stage is reached a segmentation-cavity of considerable size has been developed, which soon afterwards acquires its greatest dimensions. At the vegetative pole the four macromeres only are present, while the micromeres, which give rise to exclusively ectodermal elements, gradually diminish in size from the vegetative to the animal pole. The macromeres exhibit precisely the same arrangement as the corresponding cells in *Planorbis*. The anterior and posterior are in contact with one another, forming a sharply

* P. Sarasin, 'Entwicklungsgeschichte der *Bythinia tentaculata*.' Inaugural-Dissertation. Wiesbaden, 1882.